

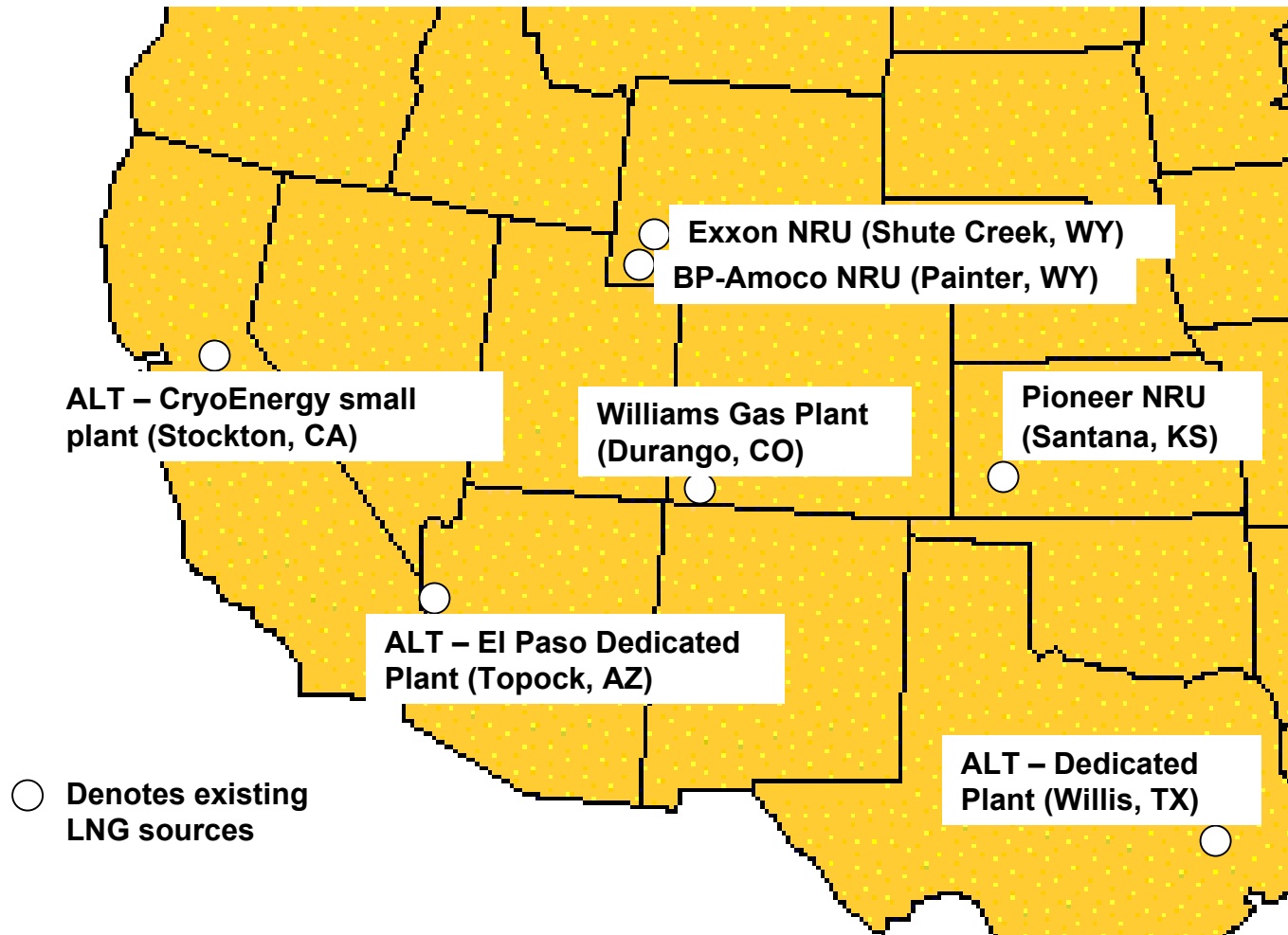
NGVTF Technical Committee Meeting
Sacramento, California
April 14 & 15, 2004

CALIFORNIA LNG TRANSPORTATION FUEL SUPPLY OUTLOOK – IMPORT TERMINALS

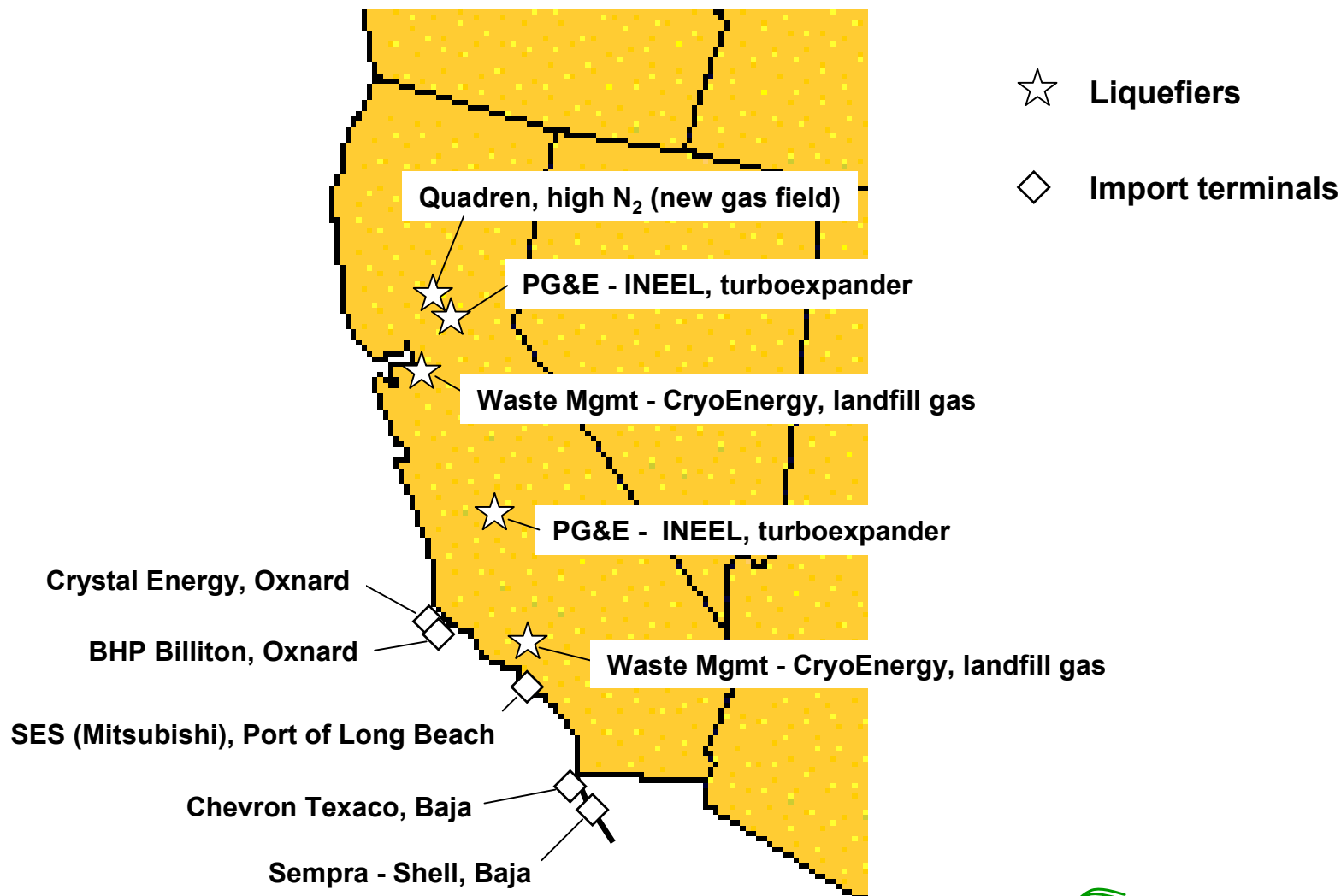
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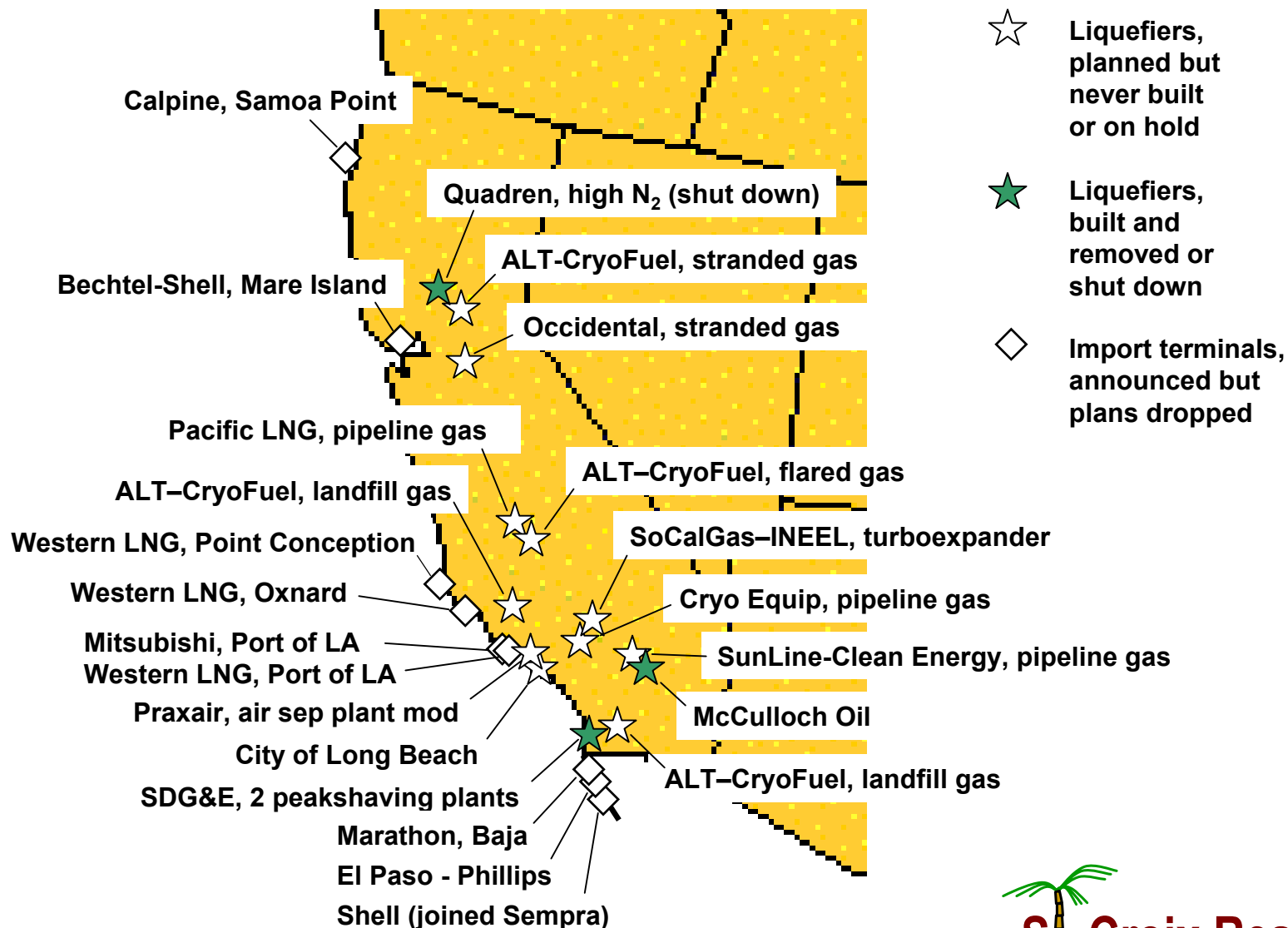
CALIFORNIA LNG SOURCES : CURRENT



CALIFORNIA LNG PROJECTS : PLANNED



CA LNG PROJECTS : DISCONTINUED



WEST COAST LNG IMPORT TERMINALS

- A big uncertainty for future California LNG transportation fuel supply
 - Will any be built?
 - Will they include LNG transportation fuel in their plans?
- Issues:
 - Market size – appears to be “a drop in the bucket”
 - Purity – nearly all imported LNG has less methane than engine manufacturers’ specifications
 - Specifications may be relaxed
 - Processes available to remove C_2+
 - Additional facilities – separate storage, truck loading, trucking
 - More straightforward for on-shore than off-shore terminals



ACTIVE CALIFORNIA IMPORT TERMINAL PROJECTS

Project Developer(s)	Location	Project Summary	Status	LNG Transp. Fuel?	Remarks
Mitsubishi (Sound Energy Solutions)	Port of Long Beach	700-1,000 mmcf/d facility planned for 25 acres at Pier T East, Berth 126, 2 x 320,000 m ³ storage tanks, NGL recovery equipment	FERC process underway, environmental and safety studies submitted, NRG selected as EIS/EIR/ASR contractor, community outreach underway	Yes	LNG transportation fuel aspect being used to promote project, startup projected 2007 or 2008, LNG from multiple sources, community resistance emerging, CPUC filed protest
BHP Billiton	14 mi. off Ventura County coast, near Oxnard and Port Hueneme	"Cabrillo Port" permanently moored import facility and FSRU in 2,900-ft water, 800 mmcf/d, 320,000 m ³ storage, 21-mi. 30-in pipeline to shore	USCG and California Lands Commission have primary jurisdiction, EEI awarded contract for EIR/EIS, community outreach underway	Probably no	BHP Billiton is an Australia-based company, startup projected 2008, Shell and/or Chevron Texaco rumored to possibly join project, LNG from Australia
Crystal Energy	11 mi. off Ventura County coast, in the Santa Barbara Channel	Reuses Platform Grace (oil platform closed by Chevron in 1997), in 318-ft water. 600 to 1,250 mmcf/d. Includes pumps, vaporizers, desalinization facility, and pipeline to shore	Application filed with USCG and California Lands Commission, community outreach campaign underway	No, not at this time	Startup projected 2007, Crystal has announced MOU with Alaska Gasline and discussions with Asia sources

ACTIVE WEST MEXICO IMPORT TERMINAL PROJECTS

Project Developer(s)	Location	Project Summary	Status	LNG Transp. Fuel?	Remarks
Sempra and Shell	Costa Azul, Baja California, Mexico (14 mi. N. of Ensenada, 60 mi S. of U.S. border)	“Energia Costa Azul” LNG terminal will have 1,000 mmcf/d send-out capability and 330,000 m ³ storage	CRE and SEMARNAT permits were issued but then suspended, Ensenada land-use permit issued, 400-acre site defined	No	Sempra (owns SoCalGas and SDG&E) originally partnered with CMS, then teamed with Shell in December 2003 (50/50), startup projected 2007, LNG from Indonesia
Chevron Texaco	8 mi. off the Baja California, Mexico, coast, approximately 1,000 ft east of South Coronado Island, and 10 mi. from the U.S. border	“Puerto Coronado” offshore terminal to use GBS in 65-ft deep water with underwater pipeline, 700 mmcf/d to expand to 1,400 mmcf/d, 250,000 m ³ storage	Permits not yet received, but permitting should go much faster than onshore LNG terminals, FEED contracts awarded to Fluor and Aker Kraerner	Probably no	GBS will include receiving terminal, storage, and regasification facilities. Startup projected 2007, LNG from Australia

RECENTLY ABANDONED IMPORT TERMINAL PROJECTS

Project Developer(s)	Location	Project Summary	Status	LNG Transp. Fuel?	Remarks
Calpine	Samoa Peninsula, Humboldt Bay, near Eureka	"Samoa Point Energy Center," 500-1,000 mmcf, 220 MW power plant	Calpine developed preliminary plans explored community acceptance	Possibly yes (prelim. plans)	Project abandoned due to strong community opposition
Bechtel and Shell	Mare Island, Vallejo	Import terminal and 1,500-MW power plant planned for closed Navy shipyard	Bechtel pursued major community outreach campaign	Advertised, but no plans or commitment	Project abandoned due to overwhelming community opposition
Marathon	Near Tijuana, Baja California, Mexico	"Tijuana Regional Energy Center": 750 mmcf LNG terminal, 1,200 MW power, desalination, and wastewater plants	CRE and SEMARNAT permits were issued, KBR and TSA awarded EPC contract	No	Baja California state government has expropriated the site land and Marathon has dropped plans
El Paso and Conoco Phillips	Rosarito, Baja California, Mexico	680 mmcf onshore facility planned	First Baja project, announced early 2001, KBR contract for FEED	Never stated, but doubtful	Permits and community support pursued, but project dropped May, 2002
Shell	Costa Azul, Baja Calif., Mexico	1,000 mmcf onshore facility	Received CRE and SEMARNAT permits	No	Dropped plans Dec., 2003 and partnered with Sempra project



ACRONYMS USED IN TABLES

CMS	=	CMS Energy Corp.
CPUC	=	California Public Utilities Commission
CRE	=	Comision Regularadora de Energia (Mexico)
CSLC	=	California State Lands Commission
EEI	=	Ecology and Environment, Inc.
EIS/EIR/ASR	=	Joint Environmental Impact Statement, Environmental Impact Report, and Application Summary Report
EPC	=	Engineering, Procurement, and Construction
FEED	=	Front End Engineering and Design
FERC	=	Federal Energy Regulatory Commission
FSRU	=	Floating Storage and Regasification Unit
GBS	=	Gravity Based Structure
KBR	=	Kellogg Brown and Root
MOU	=	Memorandum of Understanding
NGL	=	Natural Gas Liquids
NRG	=	NRG Energy, Inc.
SDG&E	=	San Diego Gas & Electric
SEMARNAT	=	Secretaria de Medio Ambiente y Recursos Naturales (Mexico)
SoCalGas	=	Southern California Gas Co.
TSA	=	Techint S.A. de C.V.
USCG	=	United States Coast Guard

SIGNIFICANT COMMUNITY OPPOSITION

From law offices of Tim Riley: www.timrileylaw.com/LNG.htm

“The energy content of a single standard LNG tanker

(one hundred twenty-five thousand cubic meters)

is equivalent to seven-tenths of a megaton of TNT, or

**about fifty-five Hiroshima
bombs.”**

Based Upon the Conservative EIR 30-Mile Dispersion Model

**A Fiery Inferno Would Engulf Everything For 30-Miles
Incinerating Communities Ranging From**

Santa Barbara, Montecito, Carpinteria, Ventura, Oxnard, Camarillo, Port Hueneme, Point
Mugu, Malibu, and Santa Monica



Brittle Power Energy Strategy for National Security

Part 2 Disasters Waiting to Happen / Chapter 8: Liquefied Natural Gas

By Lovins & Lovins



St. Croix Research